



***INSIGHT***  
**YEAR 12 *Trial Exam Paper***

**2012**  
**PSYCHOLOGY**  
**Written examination 1**  
  
***Solutions Book***

**This book presents:**

- correct solutions
- explanatory notes
- mark allocations
- tips

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## SECTION A – Multiple-choice questions

### Question 1

Marietta was sitting under a tree in the school yard, not paying any real attention to what was going on around her. Her thoughts ranged from her last lesson, to what she would have for lunch, to where she might go on the weekend. This experience fits with the ‘stream of consciousness’ theory as proposed by

- A. René Descartes.
- B. Sigmund Freud.
- C. **William James.**
- D. Wilhelm Wundt.

*Answer is C*

### Explanatory notes

- A is incorrect as René Descartes conceptualised consciousness as being the result of dualism; the interaction between the mind and the body.
- B is incorrect as Sigmund Freud developed the psychoanalytic theory of psychosexual development and proposed that the mind had three levels: the conscious, the preconscious and the unconscious.
- C is correct. William James first proposed the idea that our consciousness was like a stream as it flows continuously, is ever-changing, is personal and is selective.
- D is incorrect. Wilhelm Wundt developed the approach called structuralism, which proposed that physiological structures (mental atoms) created conscious thought.

### Question 2

As Marietta was sitting in the yard, two friends approached and asked her about her weekend. Marietta then described in great detail shopping for her Year 12 formal dress and the various dresses she was considering. Which of the following **best** describes Marietta’s state of consciousness during this discussion?

- A. normal waking consciousness
- B. **focused selective attention**
- C. an altered state of consciousness
- D. divided attention

*Answer is B*

### Explanatory notes

- A is not the **best** and, therefore, not correct because, while Marietta was in NWC, she was selectively focusing on describing her shopping experience, so B is a better response.
- B is correct as Marietta was fully focusing on describing her experiences to her friends and was not dividing her attention between this and other topics or events.
- C is incorrect as Marietta was fully alert and so not in an ASC.
- D is incorrect as there is nothing in the question to indicate that Marietta was dividing her attention between two or more stimuli.

**Question 3**

According to dualism as described by Descartes

- A. the mind is a physical structure and therefore part of the human body.
- B. the mind is a metaphysical construct and is separate from the human body and brain.**
- C. the mind is the same thing as the brain.
- D. the mind is a physical construct and is separate from the human body and brain.

**Answer is B**

**Explanatory notes**

- A is incorrect as monism proposes that the mind and body are physically connected.
- B is correct as Descartes proposed that the mind is outside of the physical constraints of the body and the brain.
- C is incorrect as this is another way of describing monism.
- D is incorrect as Descartes described the mind as a metaphysical construct, not a solid physical entity.

**Question 4**

Daydreaming is an example of

- A. normal waking consciousness.
- B. focused selective attention.
- C. an altered state of consciousness.**
- D. divided attention.

**Answer is C**

**Explanatory notes**

- A is incorrect as on the consciousness continuum daydreaming falls just below the NWC level.
- B is incorrect as selective attention is a state that occurs in NWC, where we are highly focused on a particular stimulus.
- C is correct as daydreaming is just below the level of NWC and so it is an altered state.
- D is incorrect as divided attention occurs in NWC, when we are fully alert and able to divide our attention between two or more stimuli at any one time.

### Question 5

Controlled processes are most likely to be used for a task when

- A. in an altered state of consciousness.
- B. a task is simple and well-rehearsed.
- C. little conscious effort is required.
- D. the task is complex and novel.**

*Answer is D*

#### Explanatory notes

- A is not the correct response as while it is possible to use controlled processes in an altered state, this would not be the norm. When in an altered state, consciousness is either completely focused on one stimulus (e.g. meditation) or ranges widely (e.g. when under the influence of drugs or alcohol).
- B is incorrect. A well-learned task requires automatic processes, not controlled processes.
- C is incorrect as controlled processes involve a high level of conscious effort.
- D is correct. A complex or novel task requires a higher level of concentration than an easy and well-learned task, so controlled processes are most likely to be used.

### Question 6

Isaac had to have an operation on his knee following a sporting injury. He awoke from the anaesthetic to find that his mother was sitting by the bed and, when he next opened his eyes, she was still there. Isaac thought he had closed his eyes for just a few minutes, but his mother said she had been sitting there for over an hour. Isaac's inability to gauge how much time had passed is typical of an ASC and is an example of

- A. an emotional distortion.
- B. a perceptual distortion.**
- C. a cognitive distortion.
- D. a loss of self-control.

*Answer is B*

#### Explanatory notes

- A is incorrect as estimating the flow of time is not an emotional experience.
- B is correct. Isaac's inability to gauge how much time had passed is due to his diminished ability to accurately process sensory perception.
- C is incorrect as this example does not refer specifically to the ability to think clearly and rationally.
- D is incorrect. There is no evidence of a lack of self-control in the scenario described.

*The following information is to be used to answer Questions 7 to 12.*

A researcher was interested in investigating the effects of meditation on mental wellbeing. One hundred and forty first-year university students were recruited for the study and randomly divided into two groups of 70. All participants were initially measured using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), with the researcher asking participants to indicate the degree to which their experience over the previous two weeks agreed with 14 wellbeing statements. For example, these were the first three statements:

STATEMENTS	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future.	1	2	3	4	5
I've been feeling useful.	1	2	3	4	5
I've been feeling relaxed.	1	2	3	4	5

Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) © NHS Health Scotland, University of Warwick and University of Edinburgh, 2006, all rights reserved. <http://www.healthscotland.com/documents/1467.aspx> Downloaded 13<sup>th</sup> December 2011

Over a two-week period, all participants were instructed to continue with their usual daily activities. However, participants in Group 1 were required to undertake daily 30-minute guided meditation sessions for a period of two weeks, while Group 2 were not. At the end of the two-week period, the researchers again instructed all 140 participants to complete the WEMWBS, indicating their experiences over the two weeks of the study. The results were analysed and the difference in scores between the two groups was found to be significant at the  $p < 0.05$  level, with Group 1 showing higher levels of wellbeing than Group 2, whose scores remained stable. The researcher, therefore, concluded that meditation had the potential to positively impact upon the mental health of the population.

### Question 7

The instrument used to determine the level of mental wellbeing of the participants before and after the study is an example of a

- A. questionnaire.
- B. naturalistic observation.
- C. case study.
- D. clinical interview.

**Answer is A**

### Explanatory notes

- A is correct. The WEMWBS uses a Likert scale, which is a version of a questionnaire.
- B is incorrect. Naturalistic observation involves observing voluntary behaviours of the subject within their own natural environment.
- C is incorrect. A case study is a detailed study of an individual.
- D is incorrect. A clinical interview is a structured interview involving verbal questions asked by the researcher of the subject.

**SECTION A – continued**  
**TURN OVER**

### Question 8

The independent variable in this study was operationalised as

- A. the level of wellbeing at the beginning of the study measured by the score on the WEMWBS.
- B. the level of wellbeing at the end of the study measured by the score on the WEMWBS.
- C. daily 30-minute guided meditation sessions.**
- D. the continuation of the usual daily activities by the experimental group.

*Answer is C*

#### Explanatory notes

- A is incorrect as this provided a baseline of data against which the DV could be measured.
- B is incorrect as this indicates how the DV was operationalised.
- C is correct. In order to vary the treatment given to each group, the experimental group undertook 30 minutes of guided meditation daily.
- D is incorrect as this applied to both experimental and control groups, so no behaviour was manipulated.

### Question 9

The researchers randomly divided the participants into two groups to ensure that

- A. all members of the control group had an equal chance of being selected for the study.
- B. all members of the experimental group had an equal chance of being selected for the study.
- C. all members of the population had an equal chance of being selected for the study.
- D. all members of the sample had an equal chance of being allocated to either the experimental or control groups.**

*Answer is D*

#### Explanatory notes

- A and B are incorrect. Random allocation occurs after the participants have been selected. This procedure ensures that there is a control and an experimental group.
- C is incorrect as this refers to random selection of the sample, not random allocation.
- D is correct. Once the sample has been randomly selected, the participants need to be randomly allocated to the experimental or control group in a manner that ensures all participants have an equal opportunity of being in either group. There is no bias in the allocation.

**Question 10**

The result was deemed significant because

- A. there was a 5% chance that the results were due to the manipulation of the dependent variable.
- B. there was a 5% chance that the results were due to the manipulation of the independent variable.
- C. there was a 95% chance that the results were due to the manipulation of the dependent variable.
- D. **there was a 95% chance that the results were due to the manipulation of the independent variable.**

*Answer is D*

**Explanatory notes**

- A is incorrect.  $p < 0.05$  means that there is a 5% probability that the results were due to chance. Furthermore, the dependent variable is measured not manipulated.
- B is incorrect.  $p < 0.05$  means that there is a 5% probability that the results were due to chance.
- C is incorrect. The dependent variable is not manipulated.
- D is correct.  $p < 0.05$  means that there is a 5% probability only that the results were due to chance alone and not due to the manipulation of the IV. Conversely, this means that there is a 95% probability that the result is due to the manipulation of the IV.

**Question 11**

The experimental design used in this case was

- A. **independent groups.**
- B. matched pairs.
- C. repeated measures.
- D. within participants.

*Answer is A*

**Explanatory notes**

- A is correct. Dividing the sample into two groups, a control and an experimental, that are each treated differently is known as independent groups design.
- B is incorrect. If the participants are first tested and divided into pairs matched on a particular participant-related variable, the experimental design is known as matched pairs.
- C is incorrect. This design is used when the same participants make up the control and the experimental group.
- D is incorrect as this is the same as repeated measures.

**Question 12**

The major disadvantage of this research design is:

- A. order effects are difficult to overcome.
- B. it is a very time consuming and expensive method.
- C. **the procedure needs a large number of participants to ensure that there is an even spread of participant characteristics, such as would be found in the population.**
- D. the experimenter effect is very difficult to control for.

*Answer is C*

**Explanatory notes**

- A is incorrect. There are no order effects in the independent groups design.
- B is incorrect. Independent groups is a simple and easy design to implement.
- C is correct. If the two groups are too small there will not be a sufficient spread of participant-related variables. A larger group tends to more closely correspond with the population in terms of the spread of variables.
- D is incorrect. There is no aspect of this design that specifically makes it difficult to control for the experimenter effect.

**Question 13**

Theta wave patterns typically show

- A. **medium frequency and mixed amplitude (some high, some low) waves.**
- B. a steady pattern of low frequency and high amplitude waves.
- C. high frequency and low amplitude waves.
- D. medium to high frequency and medium to low amplitude waves.

*Answer is A*

**Explanatory notes**

- A is correct Theta waves are characterised by medium frequency and mixed amplitude waves.
- B is incorrect. Low frequency and high amplitude waves are typical of delta.
- C is incorrect as this describes beta waves.
- D is incorrect as this describes alpha waves.



**Question 14**

The brainwave pattern typical of NREM Stage 4 sleep is:

- A. beta.
- B. alpha.
- C. theta.
- D. **delta.**

*Answer is D*

**Explanatory notes**

- A is incorrect. Beta waves occur in NWC and REM sleep.
- B is incorrect. Alpha waves occur in Stage 1 sleep.
- C is incorrect. Theta waves occur in Stages 1, 2 and 3 sleep.
- D is correct. Slow wave or delta waves are typical of Stage 4 NREM sleep.

**Question 15**

The hypnagogic state is characterised by \_\_\_\_\_ waves and we may also experience \_\_\_\_\_.

- A. beta, hypnic jerks
- B. alpha, nightmares
- C. **alpha and some theta, a sensation of falling and sudden awakening**
- D. delta, somnambulism

*Answer is C*

**Explanatory notes**

- A is incorrect. Beta waves do not occur in the hypnagogic state (Stage 1), however, hypnic jerks do.
- B is incorrect. Nightmares occur in REM sleep.
- C is correct. In Stage 1 sleep, alpha waves are gradually replaced by theta, and we may have a sensation of falling, which jolts us awake. We may not be aware that we were asleep.
- D is incorrect. Delta waves are characteristic of Stage 4 sleep and sleepwalking (somnambulism) can occur in Stages 3 or 4 NREM.

**Question 16**

Muscle atonia is experienced during \_\_\_\_\_ sleep and is characterised by a/an \_\_\_\_\_ in muscle tension.

- A. NREM, increase
- B. REM, increase
- C. NREM, decrease
- D. REM, decrease

*Answer is D*

**Explanatory notes**

- A, B and C are incorrect. Muscle atonia occurs in REM sleep and is characterised by a fall in muscle tension.
- D is correct. Muscle atonia or cataplexy is characterised by paralysis of the muscles, so a decrease in muscle tension, and this occurs in REM sleep.

**Question 17**

Which of the following is characteristic of a newborn (neonate) baby's sleep pattern?

- A. **approximately 16 hours of sleep with between 40 and 50 per cent spent in REM**
- B. approximately 12 hours of sleep with around 25 per cent spent in REM
- C. approximately 8 hours of sleep with between 18 and 20 per cent spent in REM
- D. approximately 7 hours of sleep with around 22 per cent spent in REM

*Answer is A*

**Explanatory notes**

- A is correct. A neonate (newborn) sleeps for approximately 16 hours per day and around half of that time is spent in REM sleep.
- B is incorrect. This pattern is typical of a 2- to 3-year-old child.
- C is incorrect. This pattern is typical of a 14- to 18-year-old adolescent.
- D is incorrect. This pattern is typical of an adult between 19 and 30 years of age.

**Question 18**

Which of the following is one of the proposed adaptive reasons for sleep?

- A. Sleep conserves energy.**
- B. Sleep repairs and replenishes the body.**
- C. Sleep increases immunity to disease.**
- D. Sleep activates growth hormones.**

***Answer is A***

**Explanatory notes**

- A is correct. According to the survival or adaptive theories of sleep, we sleep to conserve energy so that when food is scarce we have sufficient resources to survive. This is adaptive as we adapt according to how plentiful the food source is.
- B is incorrect. This is not an adaptive reason for sleep. According to the restorative theories, sleep allows us to restore our energy and prepares us for action again.
- C is incorrect. This is not an adaptive reason for sleep. According to the restorative theories, the capacity of the immune system to fight off illness is increased during sleep.
- D is incorrect. This is not an adaptive reason for sleep. According to the restorative theories, Stages 3 and 4 of NREM sleep are very important for growth, particularly during childhood and adolescence.

**Question 19**

According to research, adolescents require between \_\_\_\_\_ hours of sleep per night.

- A. 13 and 16**
- B. 9 and 10**
- C. 7 and 9**
- D. 6 and 7**

***Answer is B***

**Explanatory notes**

- A is incorrect as this is the sleep requirement of the average infant.
- B is correct. Research has found that on average adolescents require between 9 and 10 hours of sleep per night.
- C is incorrect as this is the sleep requirement of the average 30 year old.
- D is incorrect as this is the sleep requirement of the average person above the age of 60.

**Question 20**

Kristen had been studying late into the night for the past week, preparing for her end-of-semester exams and getting very little sleep. One of her teachers spoke sharply to her in class and this caused Kristen to burst into tears. Kristen's tears can be explained as an example of

- A. a physiological effect of sleep deprivation.
- B. an affective disturbance associated with sleep deprivation.**
- C. impaired cognition associated with sleep deprivation.
- D. behavioural difficulties associated with sleep deprivation.

*Answer is B*

**Explanatory notes**

- A is incorrect as crying is an emotional response and, therefore, a psychological effect, not physiological.
- B is correct. 'Affect' is another term for 'emotion'. Kristen's lack of sleep had resulted in an affective disorder.
- C is incorrect. Cognition refers to thought processes, not emotion.
- D is incorrect as there is nothing in the question to indicate a behavioural difficulty associated with sleep deprivation.

**Question 21**

When driving home from school the same day, Kristen fell asleep for around 15 seconds and veered off the road, almost hitting a tree. This brief period of sleep is best described as

- A. REM rebound.
- B. a nap.
- C. a microsleep.**
- D. daydreaming.

*Answer is C*

**Explanatory notes**

- A is incorrect as REM rebound is evidenced when we spend a larger part of our sleep time than usual in REM sleep, after a period of sleep deprivation.
- B is incorrect. A short sleep can be described as a nap, but this is not the type of sleep that specifically is referred to in the question.
- C is correct. A microsleep is very brief (3–15 seconds) sleep that occurs in the middle of an activity undertaken while we are awake. These are not uncommon when we are sleep deprived.
- D is incorrect. Daydreaming occurs when we drift from NWC into a light altered state characterised by a shift in our attention from the external world to private internal thoughts.

**Question 22**

Motion after-effect is believed to be **caused** by

- A. neural defects.
- B. neural adaptation.**
- C. a visual illusion.
- D. a perceptual anomaly.

*Answer is B*

**Explanatory notes**

- A is incorrect as the process of motion after-effect is a naturally occurring adaptive response. It is not due to any defect in neural processing.
- B is correct. Repeatedly staring at a moving object results in the motion detector neurons adapting to the motion and reducing their level of activity. At the same time, neurons that detect the opposite motion are more active, resulting in the incorrect perception of the motion being reversed.
- C is incorrect. Motion after-effect is an illusion as it is a consistent misperception of natural phenomena, but this is not the cause.
- D is incorrect. Motion after-effect is an example of a perceptual anomaly, but not caused by a perceptual anomaly.

**Question 23**

Which of the following is **not** a change condition that may result in change blindness?

- A. eye saccades
- B. eye blink
- C. very slow change
- D. spatial neglect**

*Answer is D*

**Explanatory notes**

- A, B and C are incorrect as these are all possible disruptions to an image that can result in change blindness.
- D is correct. Spatial neglect is the result of brain injury and causes the sufferer to ignore all features of the environment on the left side.

**Question 24**

Cara experienced the sensation of seeing the colour blue each time she ate a strawberry. This phenomenon is specifically known as \_\_\_\_\_ and it is commonly thought to be due to \_\_\_\_\_.

- A. a perceptual anomaly, brain damage
- B. a perceptual anomaly, a genetic predisposition
- C. **synaesthesia, a tendency for greater communication between various areas of the brain that would not normally interact**
- D. synaesthesia, changes in brain structure in old age

*Answer is C*

**Explanatory notes**

- A is incorrect. Synaesthesia is a perceptual anomaly, but this is not the best response. Synaesthesia may result from a brain injury however, but this is uncommon.
- B is incorrect. As in response A, 'perceptual anomaly' is not the ideal response. The condition can result from a genetic predisposition, however.
- C is correct. The condition described is synaesthesia and it is believed to result from a tendency for greater communication between various areas of the brain that would not normally act in unison.
- D is incorrect. Synaesthesia is the name of the condition, but it tends to appear in childhood, not old age.

**Question 25**

Expressive aphasia is another term for

- A. Wernicke's aphasia.
- B. anomia.
- C. **Broca's aphasia.**
- D. receptive aphasia.

*Answer is C*

**Explanatory notes**

- A is incorrect. Wernicke's aphasia is an alternative term for Receptive aphasia.
- B is incorrect. Anomia is the inability to recall names which may be a feature of Broca's aphasia.
- C is correct. Broca's aphasia is characterised by an inability to express oneself known as expressive aphasia.
- D is incorrect. See the explanation for response A.

**Question 26**

MRI is considered a more effective device for diagnosing structural abnormalities in the brain than the CT scan because

- A. the radioactive tracers used in MRI scans provide a clearer image of the active brain.
- B. it uses X-rays whereas the CT scan does not.
- C. **the multicoloured MRI images are clearer and more detailed than those provided by CT scans.**
- D. functional information is rich and detailed in MRI scans while the CT scan does not show function.

*Answer is C*

**Explanatory notes**

- A is incorrect as MRI does not use radioactive tracers nor does it examine the active brain. This more accurately describes PET and SPECT scans.
- B is incorrect as MRI does not use X-rays whereas CT scans do.
- C is correct. MRI provides very detailed 3-D, computer-enhanced colour pictures of the brain structures. CT scans provide 3-D, computer enhanced pictures but they are not as detailed as MRIs.
- D is incorrect as MRI does not provide functional information.

**Question 27**

When preparing for her driving test, Alicia felt anxious and on edge. This response is due to the actions of the \_\_\_\_\_ nervous system, which \_\_\_\_\_ her level of arousal in preparation for the test.

- A. **sympathetic, increased**
- B. sympathetic, decreased
- C. parasympathetic, increased
- D. parasympathetic, decreased

*Answer is A*

**Explanatory notes**

- A is correct. The anxiety triggered the fight–flight response, which is initiated by the sympathetic nervous system and increases the level of physiological arousal.
- B is incorrect as arousal is increased.
- C and D are incorrect as the parasympathetic nervous system returns the body to a state of homeostasis following the arousal triggered by the fight–flight response.

**Question 28**

After successfully completing her test, Alicia felt much better and the nervous feeling disappeared. This is due to the body being returned to a state of

- A. autonomic arousal.
- B. heightened arousal.
- C. **homeostasis.**
- D. both A and B.

*Answer is C*

**Explanatory notes**

- A is incorrect. When the fight–flight response is triggered, the sympathetic branch of the autonomic nervous system is aroused and arousal is reduced when the body is calm.
- B is incorrect. This is essentially the same as the explanation for response A.
- C is correct. When the perceived threat has passed, the parasympathetic nervous system returns the body to a state of homeostasis.
- D is incorrect. See the explanations for responses A and B.



*The following information is to be used to answer Questions 29 to 33.*

Emily is a right-handed woman and has suffered from epilepsy since early childhood. The condition has not responded to medication and, in fact, has become worse over time. Emily's doctor recommended that she undergo a radical form of surgery designed to reduce communication between the two cerebral hemispheres. Emily was later asked to take part in a study designed to measure the effects of her surgery.

### Question 29

The name of the surgical procedure Emily underwent is commonly known as

- A. **split-brain surgery.**
- B. direct brain stimulation.
- C. transcranial magnetic stimulation.
- D. hemispheric separation.

*Answer is A*

#### Explanatory notes

- A is correct. This form of surgery involves severing the corpus callosum, which essentially cuts off most communication between the two hemispheres. It is commonly called split-brain surgery.
- B is incorrect. Direct brain stimulation involves implanting a small electrode into the brain to stimulate or inhibit function of specific areas.
- C is incorrect. Transcranial magnetic stimulation involves applying a magnetic coil to the scalp to influence brain activity.
- D is incorrect. While split-brain surgery involves splitting the corpus callosum, it does not completely split the hemispheres. They are still joined at a lower level.

### Question 30

This surgery was most effective in reducing her epileptic seizures because

- A. an implanted pulse generator (IPG) causes interference with neural activity.
- B. the corpus callosum was severed, eliminating all communication between the two hemispheres.
- C. **the corpus callosum was severed, preventing communication at the higher cortical levels.**
- D. the two hemispheres were separated at the subcortical level.

*Answer is C*

#### Explanatory notes

- A is incorrect. The IPG is used in deep brain stimulation.
- B is incorrect as some communication between the two hemispheres still occurs.
- C is correct. While the brain is still connected at the subcortical level, the upper cortical areas are separated.
- D is incorrect. See the explanation for response C.

**SECTION A** – continued  
TURN OVER

**Question 31**

During the study following her surgery, a picture of an apple was very briefly shown in Emily's left visual field, but Emily was unable to say what it was. This was because

- A. communication between the right and left hemispheres was compromised.
- B. the image was processed in the left hemisphere and so could not be named.
- C. the image was processed in the right hemisphere and so could not be named.**
- D. the image was processed in the left visual cortex but this is not a language centre.

*Answer is C*

**Explanatory notes**

- A is incorrect because it is an incomplete response. Further reading of the alternative responses will clearly show that C is a better response.
- B is incorrect because the information was processed in the right hemisphere, so it could not be sent to the left to be named.
- C is the correct response. See the explanation for response B.
- D is incorrect as the information was processed in the right visual cortex, not the left.

**Question 32**

A real apple was placed behind a screen and Emily was asked to reach through the screen and touch it with her right hand. The most likely outcome of this is

- A. Emily would be able to say that it was an apple because the sensory information would be sent to the left hemisphere.**
- B. Emily would not be able to say that it was an apple because the sensory information would be processed in the right hemisphere.
- C. Emily would not be able to say that it was an apple because language centres are removed during this form of surgery.
- D. Emily would not be able to say that it was an apple because the sensory information would not be transmitted to the left hemisphere.

*Answer is A*

**Explanatory notes**

- A is correct. The right hand is controlled by the left hemisphere, so the information would be processed in the left side of the brain, where the language centres are located.
- B is incorrect. Processing would be in the left hemisphere.
- C is incorrect. Language centres are not affected in split-brain surgery. The surgery results in restrictions on information being received in the language centres.
- D is incorrect as the information *would* be processed in the left hemisphere.

**Question 33**

Which of the following is **not** a limitation of generalising results of the studies by Sperry and Gazzaniga to the wider population?

- A. Left-handed people may have their language centres in either the right or left hemispheres.
- B. Epilepsy negatively affected the patient's ability to learn the names of common everyday objects during their early childhood.**
- C. All of the patients who were studied had suffered from severe epilepsy and this may have affected their test performance.
- D. All of the patients were on long-term medication, which may have affected their test performance.

**Answer is B**

**Explanatory notes**

- A is incorrect. While right handed people tend to have language centres in the left, left-handed people may have theirs in either hemisphere. This is especially true of epilepsy patients as they are predominantly male and left-handers are more likely to be male.
- B is correct. Sperry and Gazzaniga's studies did not suggest that learning of names was impaired in early childhood due to epilepsy.
- C is incorrect as this was a limitation. The effects of epilepsy are widespread and may have adversely affected performance.
- D is incorrect as this is a limitation. It is possible that medication had adverse effects not controlled for in these studies.

**Question 34**

Davina was involved in a psychology experiment that tested reaction time. She was required to press either a red or green button in response to images flashed on to a computer screen, to indicate whether she saw a mammal (green button) or a bird (red button). Each image remained on the screen for just 0.1 seconds and the images were spaced 0.5 seconds apart. Each image would first be received in Davina's \_\_\_\_\_ memory where it would remain for \_\_\_\_\_ seconds.

- A. echoic, 0.03
- B. iconic, 0.03**
- C. echoic, 0.3
- D. iconic, 0.3

**Answer is D**

**Explanatory notes**

- A is incorrect as echoic memory is the sensory memory for sound, not images.
- B is incorrect. While images are received in iconic sensory memory, the processing time is 0.3 of a second, not 0.03.
- C is incorrect as visual sensory memory is iconic.
- D is correct. Images are stored for approximately 0.3 of a second in iconic memory.

**Question 35**

In order to select the correct button to push (red or green) Davina would need to draw on her \_\_\_\_\_ memory.

- A. episodic
- B. declarative
- C. **semantic**
- D. procedural

*Answer is C*

**Explanatory notes**

- A is incorrect. Identifying whether an image is a mammal or bird requires the use of stored knowledge about the world, not about specific episodes or events in one's life.
- B is incorrect. While semantic memory is a branch of declarative memory, so is episodic, so this is not a fully correct response.
- C is correct. Memories about the world are stored in semantic memory.
- D is incorrect. Procedural memory is the memory for how to carry out specific procedures or actions.

**Question 36**

In the experimental data collection sheets, Davina was identified as 'Participant 1' and she was required by the researchers to sign a document setting out her rights, roles and any risks involved in the experiment. Which of the following ethical considerations would best describe these two features of the research?

- A. confidentiality, debriefing
- B. **confidentiality, informed consent**
- C. privacy, voluntary participation
- D. voluntary participation, debriefing

*Answer is B*

**Explanatory notes**

- A is incorrect as debriefing involves fully informing the participants of all aspects of the study not previously covered once the study has concluded, and remedying any ill-effects that may have occurred.
- B is correct. By not identifying Davina by name, her confidentiality is protected and by asking her to sign the document setting out all of the details of the experiment in advance, the consideration of informed consent is followed.
- C is incorrect as the correct term is 'confidentiality' not 'privacy' and, while the informed consent document would have indicated that participation was voluntary, this is not a sufficient explanation of the procedure.
- D is incorrect. See the explanations for responses A and C.

**Question 37**

Davis was very interested in steam trains and, in order to remember the names of the different engines, he made up a story using all of the names. He hoped that when he recalled the story he would easily remember all of the engine names. This method of storing information relies upon \_\_\_\_\_ and is a form of mnemonic known as \_\_\_\_\_.

- A.     elaborative rehearsal, narrative chaining**
- B.     elaborative rehearsal, an acrostic**
- C.     maintenance rehearsal, narrative chaining**
- D.     maintenance rehearsal, an acrostic**

***Answer is A***

**Explanatory notes**

- A is correct. Elaborative rehearsal involves adding newly learned information to information already stored in LTM, by adding extra meaning to the material. Narrative chaining involves putting all of the words to be remembered in a story.
- B is incorrect as an acrostic is a poem created by beginning each line with the letters of each word that needs to be remembered.
- C and D are incorrect as maintenance rehearsal involves repeating information to be remembered over and over again, thus keeping it (maintaining it) in STM until it is no longer needed.

**Question 38**

According to Baddeley and Hitch's model of working memory, when retrieving words from LTM in order to link these to the names of the steam engines, Davis was using his

- A.     central executive.**
- B.     visuospatial sketchpad.**
- C.     episodic buffer.**
- D.     phonological loop.**

***Answer is C***

**Explanatory notes**

- A is incorrect. The central executive is responsible for coordinating sensory information from the visuospatial sketchpad and the phonological loop. This aids in our decision regarding what to attend to, and changing our attention, and also modifies information to be stored in LTM.
- B is incorrect. The visuospatial sketchpad is the memory store used to store visual sensory information.
- C is correct. The episodic buffer helps retrieve information from LTM (names of steam engines) to further enhance information held in working memory. It is also used to select and encode information to be stored in LTM.
- D is incorrect. The phonological loop is the memory store for auditory sensory information.

**Question 39**

According to the Levels of Processing theory proposed by Craik and Lockhart (1972), the type of encoding used by Davis to memorise the engine names (as explained in Question 37) was \_\_\_\_\_, which would involve a \_\_\_\_\_ level of processing.

- A. structural, shallow
- B. structural, moderate
- C. phonemic, deep
- D. **semantic, deep**

*Answer is D*

**Explanatory notes**

- A is incorrect. According to Craik and Lockhart, structural encoding involves remembering physical features of words, which uses a shallow level of processing.
- B is incorrect. See the explanation for response A.
- C is incorrect as phonemic encoding means that words are learned according to how they sound, which requires a moderate level of processing.
- D is correct. Semantic encoding involves using meaningful encoding which links words to those already stored in semantic networks. It requires a deep level of processing.

**Question 40**

When stimulating the neurons of the Aplysia with a glass rod, Eric Kandel and colleagues found that physical changes occurred at the neuronal level and these resulted in learned behaviour. This occurred because

- A. **following learning, the pre-synaptic neurons were more likely to release neurotransmitters, thus stimulating post-synaptic neurons.**
- B. following learning, the post-synaptic neurons were more likely to release neurotransmitters, thus stimulating pre-synaptic neurons.
- C. following learning, the pre-synaptic neurons were less likely to release neurotransmitters, thus stimulating post-synaptic neurons.
- D. following learning, the pre-synaptic neurons were more likely to release neurotransmitters, thus inhibiting the firing of post-synaptic neurons.

*Answer is A*

**Explanatory notes**

- A is correct as learning involves changes in the pre-synaptic and post-synaptic neurons. When learning has occurred, these neurons are more likely to be excited.
- B is incorrect as post-synaptic neurons receive the neurotransmitter, they do not release it.
- C is incorrect as excitation of the neurons is more likely.
- D is incorrect as the post-synaptic neurons are more likely to be excited, not inhibited.

**Question 41**

Another way of explaining the findings in Question 40 is to say that there is an increased tendency for neurons to fire after they have been stimulated by other neurons. This is known as

- A. neuronal strengthening.
- B. long-term potentiation.**
- C. long-term memory formation.
- D. post-synaptic potentiation.

**Answer is B**

**Explanatory notes**

- A is incorrect. Although new learning will result in the strengthening of neural connections, neuronal strengthening is not the correct term.
- B is correct. When a group of pre-synaptic neurons are stimulated, the dendrites in the post-synaptic neurons have greater long-term potential to fire in response.
- C is incorrect. While the stimulation of connecting neurons can result in the formation of long-term memories, it is not correct to say that this process is known as long-term memory formation.
- D is incorrect. The action will result in the increased potential of post-synaptic neurons to fire, but this is not the correct term.

**Question 42**

Keith was learning to ride his bike and, after a few falls, managed to stay upright. The more he practised, the better he became at riding, until he could ride without having to think about how to do it. The two areas of the brain responsible for this form of memory formation are

- A. the hippocampus and the cerebellum.
- B. the occipital lobes and the cerebellum.
- C. the cerebrum and the basal ganglia.
- D. the basal ganglia and the amygdala.**

**Answer is D**

**Explanatory notes**

- A is incorrect as the hippocampus is responsible for the consolidation and retrieval of declarative memories, while the cerebellum is responsible for motor skills and classically conditioned memories.
- B is incorrect as the occipital lobes are responsible for the processing of visual information, but the cerebellum is responsible for the formation of motor memories and for classically conditioned memories.
- C is incorrect. Although the basal ganglia are involved in long-term procedural memory formation, the cerebrum is too general a term.
- D is correct. The basal ganglia and the amygdala are both active in the formation of procedural memories, such as how to ride a bike.

**Question 43**

As Keith ages it is likely that his ability to ride a bike will not be forgotten because

- A. older people perform equally well as younger people on declarative memory tasks.
- B. older people perform equally well as younger people on procedural memory tasks.**
- C. older people have little trouble retrieving explicit memories.
- D. older people have little trouble retrieving episodic memories.

**Answer is B**

**Explanatory notes**

- A is incorrect as procedural memories are not declarative.
- B is correct. A well-learned procedural task is not likely to be forgotten as we age.
- C is incorrect as riding a bike is an implicit memory not an explicit memory.
- D is incorrect as riding a bike is a procedural memory and research has found that episodic memories are vulnerable to decay as we age.

**Question 44**

The amygdala and the hippocampus are located in

- A. the mid-brain.
- B. the medial temporal lobe.**
- C. the cerebellum.
- D. the frontal lobe.

**Answer is B**

**Explanatory notes**

- A is incorrect. The amygdala and the hippocampus are located in the medial temporal lobe, which is part of the forebrain, not the mid-brain.
- B is correct. The medial temporal lobe is a structure of the cerebral cortex, where the amygdala and hippocampus are located.
- C is incorrect. The cerebellum is a structure of the hindbrain.
- D is incorrect. The frontal lobe contains the primary motor cortex and Broca's area (left frontal lobe), but not the amygdala and hippocampus.



**Question 45**

The theory that proposes that memories must have time to stabilise if long-term memories are to be formed is known as the \_\_\_\_\_ theory and the structure most important for this process is the \_\_\_\_\_.

- A. consolidation, hippocampus**
- B. consolidation, amygdala**
- C. semantic network, hippocampus**
- D. semantic network, amygdala**

***Answer is A***

**Explanatory notes**

- A is correct. The consolidation theory proposes that in order for memories to be stabilised, the neural changes need time to consolidate and this process relies on the hippocampus.
- B is incorrect as the amygdala is not important in the consolidation process.
- C and D are incorrect as the semantic network theory proposes that information is organised in the brain in the form of neural networks, with information that is linked stored close together so that the triggering of one memory will trigger the recall of similar memories.

**END OF SECTION A**

**END OF SECTION A  
TURN OVER**

## SECTION B – Short-answer questions

### Question 1

Taji was having trouble sleeping so his doctor referred him to a sleep laboratory where various physiological measurements were taken while he slept.

- a. One of the measured responses recorded body temperature. How can this indicate what stage of sleep a person is in?

1 mark

### Answer

Body temperature changes as we sleep and is at its lowest level during NREM sleep.

### Mark allocation

- 1 mark for stating that body temperature changes during sleep and indicates the stage of sleep.
- b. Taji's doctor wanted to collect data related to Taji's eye movements and brain activity while he slept. **Identify** and **explain** the function of the two main devices that would be used to collect this data.

4 marks

### Answer

1. Electrooculargraph (EOG) is used to detect, amplify and record electrical activity of the muscles that are responsible for eye movements.
2. Electroencephalogram (EEG) is used to detect, amplify and record electrical activity of the brain.

### Mark allocation

- 1 mark each for identifying the two devices used (2 marks)
- 1 mark each for accurately describing the function of each device – answer must state precisely what is being measured by each device (2 marks)

**Note:** It is **not** acceptable to refer to eye muscles for the EOG. The eyes don't have muscles; they are moved by the muscles surrounding the eye.

### Tip

- Remember the acronym *DARE* – *Detect Amplify Record Electrical activity*.

## Question 2

What does the galvanic skin response measure and how can this be used to indicate a person's state of consciousness?

3 marks

### Answer

The GSR measures the electrical conductivity of the skin.

If a person is in a state of heightened arousal, for example, in a highly agitated state due to illicit drug use, they are likely to perspire more, so that electrical conductivity of the skin will increase. This can indicate that the person is in an altered state of consciousness.

### Mark allocation

- 1 mark for correctly identifying that the GSR measures the electrical conductivity of the skin.
- 1 mark for stating the type of activity that might increase (or decrease) the GSR.
- 1 mark for explaining how this can indicate a state of consciousness.

## Question 3

Thomas has just bought the game 'Grand Theft Auto' and is trying really hard to master each level.

- a. **Explain** this behaviour in terms of Thomas' state of consciousness and how the reticular activating system (RAS) would respond as Thomas plays the game. In your answer, refer to the specific functions and structures of the RAS as he plays.

4 marks

### Answer

The RAS regulates awareness and Thomas would be using selective attention to play the game.

The neurons of the RAS will have a higher level of activity and increased blood flow would be evident in the RAS, the mid-brain and the cerebral cortex.

### Mark allocation

- 1 mark for identifying that the RAS regulates awareness (function).
- 1 mark for identifying that Thomas would be using selective attention (function).
- 1 mark for explaining that the higher level of attention would result in a higher level of activation of the neurons of the RAS (function and structure).
- 1 mark for indicating that there would be increased blood flow in the region of the RAS (function).

### Tips

- *The full name of the RAS was provided in the question so it is acceptable to use the abbreviation in your answer. If the question had asked you to identify the area most important for regulating awareness, you would need to provide the full name.*
- *In a question such as this, it is important to think about where the four marks might come from. It may help you to number your responses as you write to ensure that you provide four distinct pieces of information.*

**SECTION B** – continued  
TURN OVER

- b. Explain** the role of Thomas' somatic nervous system as he plays the game.

2 marks

**Answer**

The somatic nervous system is responsible for the movement of skeletal muscles. The motor messages sent to the somatic nervous system via motor neurons from the central nervous system would activate the muscles Thomas would be using to play the game.

**Mark allocation**

- 1 mark for identifying that the somatic nervous system is responsible for the movement of skeletal muscles used while he plays.
- 1 mark for explaining the role of motor neurons.

**Tip**

- *Note that motor messages are sent via motor neurons. It is incorrect to say that motor neurons are sent – neurons don't travel, they relay messages.*

**Question 4**

**Identify** and **explain** the main functions of the somatic and autonomic nervous systems.

3 marks

**Answer**

The somatic nervous system is responsible for the voluntary movement of skeletal muscles while the autonomic is responsible for the functioning of the body's internal organs, glands and visceral muscles, and for regulating autonomic functions, such as heart rate, respiratory rate etc.

**Mark allocation**

- 1 mark for stating that the somatic nervous system is responsible for voluntary movement of skeletal muscles.
- 1 mark for stating that the autonomic nervous system is responsible for the functioning of the internal organs and glands.
- 1 mark for stating that the autonomic nervous system is responsible for regulating autonomic functions.

### Question 5

Alcohol can have negative effects on us at a psychological and physiological level. **Identify** and **explain** one long-term negative psychological effect of alcohol abuse and one long-term negative physiological effect of alcohol abuse.

4 marks

### Answer

Psychological :

Irreversible memory loss – Korsakoff’s syndrome. A condition common to chronic alcoholics, where the ability to form new memories is lost (anterograde amnesia).

(Also accepted will be explanations of the long-term negative impacts upon family/social cohesion caused by alcohol abuse, for example: increased anger and aggression becoming a repeated response and leading to domestic violence).

Physiological:

Cirrhosis of the liver – a disease of the liver related to long-term alcohol abuse, where the liver builds up scar tissue, preventing it from functioning adequately potentially resulting in liver failure.

(Also accepted will be explanations of the damage to the adolescent brain caused by long-term alcohol abuse impeding the natural development of the brain).

### Mark allocation

- 1 mark for identifying a long-term psychological effect of alcohol abuse.
- 1 mark for explaining that effect or condition.
- 1 mark for identifying a long-term physiological effect of alcohol abuse.
- 1 mark for explaining that effect or condition.

### Tips

- *Take care with questions such as this one. Note the key words. **Long-term** refers to negative effects that are long-lasting and due to years of alcohol abuse. It is not sufficient to refer to a short-term effect, such as ‘lowered level of awareness’.*
- *Do not confuse the terms **psychological** and **physiological**. Psychological refers to the brain and effects on cognition, memory, planning and emotion. Physiological refers to physical damage, for example, damage to an organ, such as the brain or the liver.*
- *Think carefully before answering.*

**Question 6**

Krishna was diagnosed with spatial neglect.

- a. **Identify** the most likely cause of this condition.

1 mark

**Answer**

Spatial neglect is an acquired brain injury commonly caused by stroke or other forms of injury resulting in brain damage.

**Mark allocation**

- 1 mark for correctly identifying the cause of spatial neglect as related to brain injury. (Organic brain damage is also acceptable.)

- b. **Explain** how this condition is commonly experienced.

1 mark

**Answer**

In spatial neglect (also known as neglect syndrome), the injured person routinely ignores any stimuli in the left visual field or on their left side.

**Mark allocation**

- 1 mark for correctly explaining that this condition results in a tendency to ignore stimuli on the left.
- c. Fully **explain** how PET scanning could be used to diagnose this condition. In your answer, identify precisely what the scan would show and what part of the brain would be examined.

3 marks

**Answer**

The PET scan (positron emission tomography) provides images of the active brain by detecting increased areas of blood flow and glucose consumption in active areas, which are indicated by a colour code – red for the highest level of activity, violet for the lowest level. Krishna's scan would show decreased activity (violet areas) in the right parietal lobe.

**Mark allocation**

- 1 mark for stating that active areas have increased blood flow and glucose consumption. (Glucose must be mentioned.)
- 1 mark for describing the colour code.
- 1 mark for identifying the right parietal lobe as the area of lowest activity.

**Question 7**

In the table below, **identify** the names of the three memory stores in the Atkinson–Shiffrin multi-store model of human memory, and the relative capacity and duration of each.

3 marks

**Answer**

Name	Capacity	Duration
Sensory memory	Unlimited	Between 0.3 and 3 seconds
Short-term memory	Between 5 and 9 bits of information (7 + or – 2)	18–20 seconds
Long-term memory	Unlimited	Indefinite

**Mark allocation**

- 1 mark for each correct column or row of information.

**Note:** In sensory memory, duration must state seconds; in STM you must say ‘bits of information’ not just 5–9; and abbreviations, such as STM, are not acceptable.

**Question 8**

**Identify** the three main functions of the central executive in the Baddeley and Hitch model of working memory.

3 marks

**Answer**

1. Inhibition or screening out irrelevant material
2. Switching – shifting attention from one item to another
3. Modifying information via the episodic buffer before re-storing info in LTM; or adapting the semantic network to accommodate new information.

**Mark allocation**

- 1 mark for each correct function identified.

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**Question 9**

- a. Explain how Alzheimer's disease involves both anterograde and retrograde amnesia.

2 marks

**Answer**

Patients have difficulty forming new memories (anterograde) due to damage to the hippocampus and have difficulty retrieving stored memories (retrograde) or lose stored memories due to damage to the pre-frontal cortex.

**Mark allocation**

- 1 mark for identifying that new memories can't be formed (anterograde amnesia).
- 1 mark for identifying that old memories are lost (retrograde).
- Each form of amnesia must be clearly identified in the response.

- b. How can MRI be used to help diagnose Alzheimer's disease?

1 mark

**Answer**

As MRI is used to show structure and structural changes, it could identify increased ventricle size in an Alzheimer's patient.

OR

MRI could indicate the isolation of the hippocampus in an Alzheimer's patient.

**Mark allocation**

- 1 mark for either of the pieces of information provided above.

**Note:** The response must be specific to Alzheimer's disease. It would not be sufficient to say, for example, 'the MRI would indicate brain damage'.

**END OF SECTION B**

**END OF SECTION B**  
TURN OVER

## Section C – Extended response question

**Identify** and **explain** two theories of forgetting and, where applicable, the limitations of each. In your answer ensure that you define or explain each term.

10 marks

**Sample responses** – any two of the theories below may be chosen.

Retrieval failure theory:

- Also called cue dependent forgetting .(1)
- Forgetting is an inability to retrieve information at the time because the right retrieval cue has not been used. The memory trace is not lost, it is just not accessible at that time. (1)
- Retrieval cues may be context or state dependent – we recall information when we are in the same situation (1) or same emotional state (1) as when the memory was formed. So, forgetting occurs when we do not have the same context or state available to us (1).
- The tip of the tongue phenomenon (ToT) occurs when we have some cues but not enough to fully recall the information. For example, we may remember the first letter, the sound of the word or where we first memorised it, but cannot fully retrieve the information at that time. This usually is short-lived and the information will pop into the mind when we stop consciously trying to recall it (2).

Motivated forgetting:

- A Freudian concept that states we forget because we have a reason to forget. (1)
- Suppression – we consciously choose not to recall information because we prefer not to think of the information (1), for example, choosing not to recall the circumstances surrounding a family argument (1).
- Repression – we unconsciously choose to forget because it is too painful to recall the information.(1), For example, an instance of abuse as a child may be repressed (1) as a protective or defence mechanism (1). The individual has no conscious knowledge of the memory (1).
- The major criticism of this theory is that we may be assisted to access false memories, that is, be encouraged to think that an event happened and, therefore, create a memory to fit this scenario (1). This is a major concern in therapy that taps into the unconscious mind, such as hypnosis. The false memory can be planted while under hypnosis and called forth by the therapist (1).
- Elizabeth Loftus found that memory recall can be influenced by misinformation that is presented to the subject, thus distorting the actual memory (1).

Decay theory:

- Memory traces in the brain will decay or fade over time due to lack of use (1). If the memory isn't retrieved for a long period of time, the neural trace fades (1).
- One criticism is that this doesn't explain how memories that have not been retrieved for a very long period of time can be recalled in vivid detail (1) when the right cue is presented (1). This also does not explain why procedural memories are resistant to forgetting (1). We can recall how to do something even if we haven't done it in a long time, for example, touch type (2).

### Interference theory:

- We have difficulty retrieving information because it is being blocked or interfered with by other memories (1).
- Retroactive interference – difficulty in retrieving previously learned material (1) because newly learned material is interfering with the recall (1).
- Proactive interference – difficulty in retrieving newly learned material (1) because previously learned material is interfering with recall (1).
- Interference is most likely to occur when the two sets of information are very similar (1).
- Tests of recall have been used in experiments and these are particularly vulnerable to interference (1).
- One criticism is that well-encoded or semantically relevant information may be very readily recalled even if there are similar pieces of information stored (2), that is, similar information does not always interfere.

### Mark allocation

- Students are required to explain two separate theories. A list of suggested pieces of information is provided for each theory here with corresponding mark allocations. Teachers should use their own discretion in awarding marks. For example: You may wish to allocate a maximum of 5 marks to each theory, not allowing students to, for example, gain 7 marks for the first and 3 for the second.

**END OF SECTION C**

**END OF SOLUTIONS BOOK**